Air Quality in Alberta
January to March, 2001

Alberta Environment continuously monitors air quality in Edmonton (three stations), Calgary (three stations), Red Deer, Fort Saskatchewan and Beaverlodge (35 km west-northwest of Grande Prairie). Air quality parameters monitored at Alberta Environment stations include carbon monoxide, dust and smoke, oxides of nitrogen, ozone, total hydrocarbons, hydrogen sulphide, sulphur dioxide, ammonia and particulates (PM_{10} and $PM_{2.5}$). The Index of the Quality of the Air (IQUA) is calculated at the Edmonton, Calgary, Red Deer and Fort Saskatchewan stations. The IQUA converts air parameter concentrations into ***Good***, ***Fair***, ***Poor*** and ***Very Poor*** air quality ratings.

Highlights

- **Air quality was rated *Good* at least 99 per cent of the time at all monitoring stations from January to March 2001.** ***Good*** air quality was reported 100 per cent of the time at the Edmonton Central, Edmonton Northwest and Calgary Central monitoring stations. The frequency of ***Good*** air quality was slightly better than the ten-year average (1991 to 2000) at all stations. In fact, at the Fort Saskatchewan station, the frequency of ***Good*** air quality from January to March 2001 was 99.6% compared to the ten-year average of 96.6% (for January to March). Good air quality is the best possible rating and means that there are no known harmful effects to human or environmental health.

- ***Fair*** air quality was reported the remainder of the time (less than one per cent) at all stations. ***Fair*** air quality means that there is adequate protection against harmful effects.

- ***Poor* and *Very Poor* air quality did not occur at any monitoring stations in the first quarter of 2001.** ***Poor*** and ***Very Poor*** air quality is rare in Alberta. From 1991 to 2000, there have been only eight occurrences of ***Poor*** air quality at Edmonton and Calgary monitoring stations in January, February or March. ***Very Poor*** air quality has only occurred once in these months over the past ten years at Alberta monitoring stations.

★ Air Quality Monitoring Station

For current air quality conditions call ***427-7273*** in Edmonton and ***250-2099*** in Calgary.

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☞ **Air quality guidelines for sulphur dioxide, hydrogen sulphide, nitrogen dioxide, ozone and dust and smoke were not exceeded in the first quarter of 2001.** However, the eight-hour guideline for carbon monoxide was exceeded one time at the Edmonton Northwest station (4 p.m. to midnight on January 10) and one time at the Calgary East station (4 p.m. to midnight on January 8). These exceedances were caused by vehicle exhaust emissions during stagnant weather conditions (light winds and a strong temperature inversion). The one-hour guideline for carbon monoxide was not exceeded in January, February or March of 2001.

☞ **Concentrations of many pollutants emitted by automobiles were lower in the first quarter of 2001 than the ten-year average.** The average carbon monoxide concentration in the first quarter of 2001 was from 19 to 44 per cent lower than the average over the previous ten years (1991 to 2000). Average nitrogen dioxide levels in the first quarter were from seven to 21 per cent lower than the ten-year average. Dust and smoke levels were from 13 to 42 per cent lower than the ten-year average at all stations except for the Calgary Northwest station. At the Calgary Northwest station, the average dust and smoke value in the first quarter of 2001 was 0.16 COH units compared to 0.11 COH units for the previous ten years. This increase in dust and smoke values at the Calgary Northwest station is likely due to the combination of increased traffic near the station and dry weather conditions. Lower air pollution levels at urban monitoring stations are primarily due to improvements in emission control systems on newer vehicles.

Number of Times Air Quality Guidelines were Exceeded - January to March, 2001

Station	Carbon Monoxide		Dust and Smoke	Hydrogen Sulphide		Nitrogen Dioxide		Ozone	Sulphur Dioxide	
	1-hour	8-hour	monthly	1-hour	24-hour	1-hour	24-hour	1-hour	1-hour	24-hour
Edmonton Central	0	0	0	na	na	0	0	0	na	na
Edmonton Northwest	0	1	0	na	na	0	0	0	na	na
Edmonton East	0	0	0	0	0	0	0	0	0	0
Calgary Central	0	0	0	na	na	0	0	0	na	na
Calgary Northwest	0	0	0	na	na	0	0	0	na	na
Calgary East	0	1	0	0	0	0	0	0	0	0
Red Deer	0	0	na	0	0	0	0	0	0	0
Fort Saskatchewan	0	0	0	0	0	0	0	0	0	0
Beaverlodge	na	na	na	na	na	0	0	0	0	0
Guideline	13 ppm	5 ppm	% of values< 1 COH	0.01 ppm	0.003 ppm	0.212 ppm	0.106 ppm	0.082 ppm	0.172 ppm	0.057 ppm

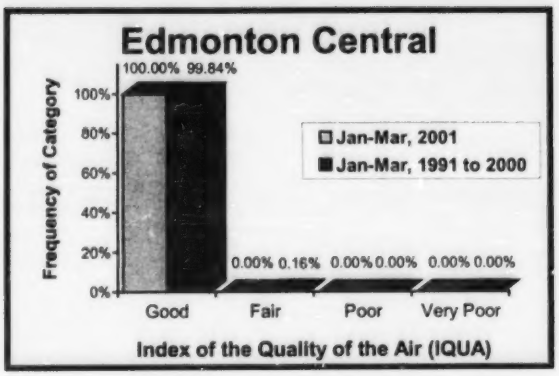
na Parameter not monitored at this location.

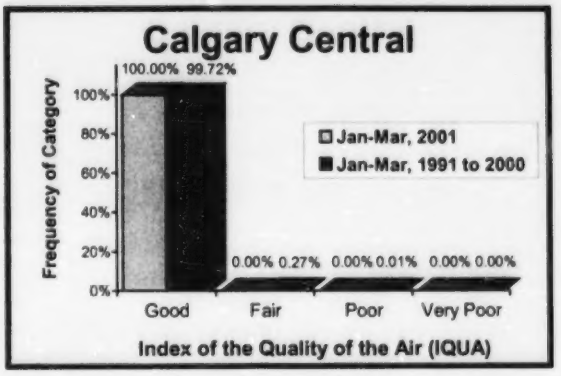
The Index of the Quality of the Air

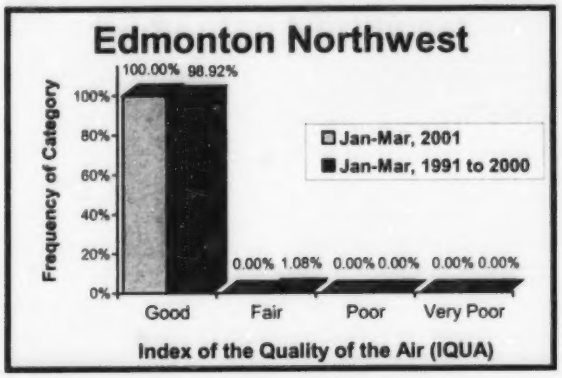
The index of the quality of the air (IQUA) provides the public with a meaningful measure of outdoor air quality. The IQUA is calculated every hour at all Edmonton, Calgary, Red Deer and Fort Saskatchewan monitoring stations. From this index, we can effectively rate air quality as Good, Fair, Poor or Very Poor. Air pollutants used to calculate the IQUA are carbon monoxide, dust and smoke, nitrogen dioxide, ozone and sulphur dioxide. Good, Fair, Poor and Very Poor air quality categories are directly related to guidelines under Alberta's *Environmental Protection and Enhancement Act*, and National Ambient Air Quality Objectives.

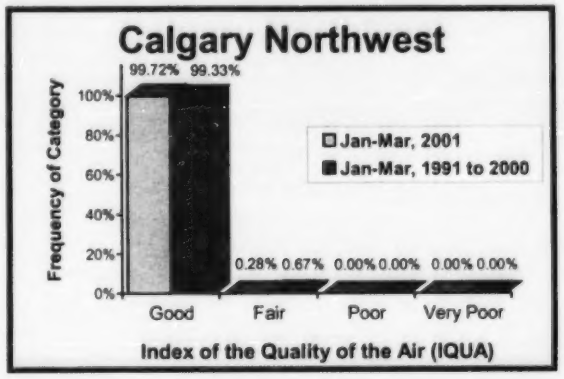
IQUA rating	Description
Good	Desirable range: no known harmful effects to soil, water, vegetation, animals, materials, visibility or human health. The long-term goal is for air quality to be in this range all of the time in Canada.
Fair	Acceptable range: adequate protection against harmful effects to soil, water, vegetation, animals, materials, visibility and human health.
Poor	Tolerable range: not all aspects of the environment are adequately protected from possible adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.
Very Poor	Intolerable range: in this range, continued high readings could pose a risk to public health.

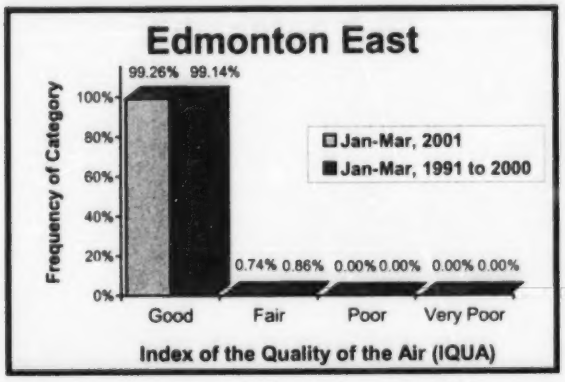
Source: Environment Canada. 1980. Guideline for a short-term air quality index. A report by the Federal-Provincial committee on Air Pollution.

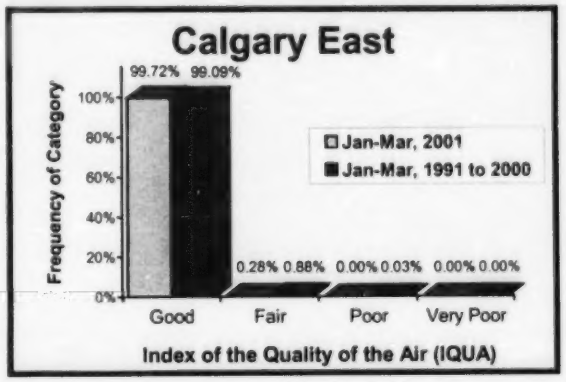

Edmonton Central
Frequency of Category
100.00% 99.84%
0.00% 0.16% 0.00% 0.00% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)

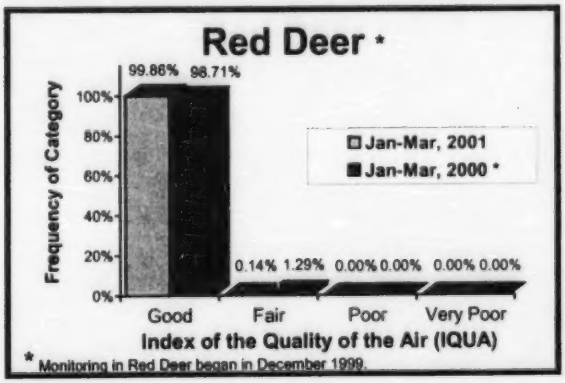

Calgary Central
Frequency of Category
100.00% 99.72%
0.00% 0.27% 0.00% 0.01% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)

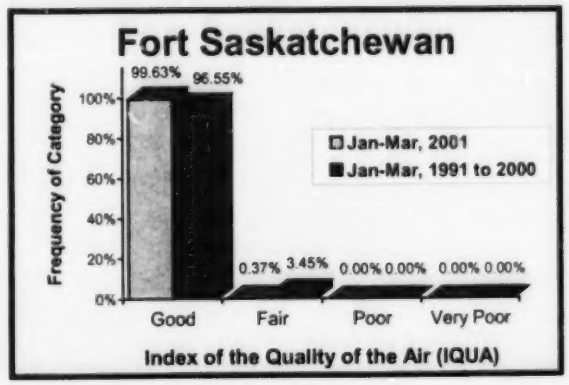

Edmonton Northwest
Frequency of Category
100.00% 98.92%
0.00% 1.08% 0.00% 0.00% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)


Calgary Northwest
Frequency of Category
99.72% 99.33%
0.28% 0.67% 0.00% 0.00% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)


Edmonton East
Frequency of Category
99.26% 99.14%
0.74% 0.86% 0.00% 0.00% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)


Calgary East
Frequency of Category
99.72% 99.09%
0.28% 0.88% 0.00% 0.03% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)


Red Deer *
Frequency of Category
99.86% 98.71%
0.14% 1.29% 0.00% 0.00% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 2000 *
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)
* Monitoring in Red Deer began in December 1999.


Fort Saskatchewan
Frequency of Category
99.63% 96.55%
0.37% 3.45% 0.00% 0.00% 0.00% 0.00%
Jan-Mar, 2001
Jan-Mar, 1991 to 2000
Good
Fair
Poor
Very Poor
Index of the Quality of the Air (IQUA)

Average Concentrations - January to March, 2001 [a]

Parameter	Monitoring Period	Edmonton Stations			Calgary Stations			Red Deer [h]	Fort Saskatchewan	Beaverlodge [c]
		Central	Northwest	East	Central	Northwest	East			
Carbon Monoxide	Jan-Mar 2001	0.79	0.93	0.44	0.73	0.46	0.81	0.59	0.46	na
(ppm)	Jan-Mar 1991-2000	1.29	1.15	0.58	1.31	0.77	1.22	0.51	0.58	na
Dust and Smoke	Jan-Mar 2001	0.12	0.17	0.16	0.20	0.16	0.29	na	0.11	na
(COH unit)	Jan-Mar 1991-2000	0.21	0.27	0.23	0.23	0.11	0.33	na	0.14	na
Hydrogen Sulphide	Jan-Mar 2001	na	na	0.001	na	na	0.001	0.001	0.000	na
(ppm)	Jan-Mar 1991-2000 [b]	na	na	0.001	na	na	0.001	0.001	0.001	na
Nitrogen Dioxide	Jan-Mar 2001	0.030	0.028	0.022	0.031	0.019	0.029	0.020	0.017	0.004
(ppm)	Jan-Mar 1991-2000	0.034	0.031	0.025	0.039	0.024	0.034	0.022	0.020	0.007
Ozone	Jan-Mar 2001	0.013	0.014	0.019	0.013	0.022	0.014	0.017	0.019	0.028
(ppm)	Jan-Mar 1991-2000	0.013	0.015	0.020	0.011	0.020	0.013	0.016	0.023	0.030
Sulphur Dioxide	Jan-Mar 2001	na	na	0.003	na	na	0.003	0.001	0.002	0.001
(ppm)	Jan-Mar 1991-2000 [d]	na	na	0.003	na	na	0.004	0.001	0.003	0.001
Total Hydrocarbons	Jan-Mar 2001	2.13	2.48	2.40	2.15	2.26	2.37	2.44	2.09	na
(ppm)	Jan-Mar 1991-2000	2.46	2.28	2.45	2.28	2.15	2.30	2.30	2.14	na
Particulate	Jan-Mar 2001	na	28.5	na	26.7	na	na	na	na	na
(PM_{10} in $\mu g/m^3$)	Jan-Mar 1994-97 [e]	na	21.1	17.1	29.5	na	na	17.0	na	na
Particulate	Jan-Mar 2001	8.0	14.2	8.6	8.9	na	na	7.5	na	na
($PM_{2.5}$ in $\mu g/m^3$)	Jan-Mar 1998 [f,g]	na	12.6	na	12.0	na	na	na	na	na
Ammonia	Jan-Mar 2001	na	na	na	na	na	na	na	0.004	na
(ppm)	Jan-Mar 1991-2000	na	na	na	na	na	na	na	0.004	na

a All average values based on data collected from January to March.

b Hydrogen sulphide monitoring began in February 1991 at the Edmonton East station.

c Monitoring at the Beaverlodge station began in November 1997.

d Sulphur dioxide monitoring began in February 1999 at the Beaverlodge station.

e PM_{10} monitoring began in January 1996 at the Calgary Central station and November 1993 at the Edmonton Northwest station.

f The PM_{10} monitor at the Edmonton East station was converted to $PM_{2.5}$ in August 2000. The PM_{10} monitor at the Red Deer station was converted to $PM_{2.5}$ in December 2000.

g $PM_{2.5}$ monitoring began in November 1997 at the Calgary Central station, July 1998 at the Edmonton Northwest station and October 2000 at the Edmonton Central station.

h Monitoring at the Red Deer station began in December 1999.

na Parameter not monitored at this location.